



Leopoldina
Nationale Akademie
der Wissenschaften



The 3rd Joint Inter-Academy Symposium
of the
Israel Academy of Sciences and Humanities
and the
German National Academy of Sciences, Leopoldina

**Stability and Plasticity:
Advances in Understanding
Neuronal Representations**

Jerusalem

December 1-2, 2013



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Stability and Plasticity: Advances in Understanding Neuronal Representations

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Organizing Committee:

Yadin Dudai – *The Weizmann Institute of Science, Rehovot*

Peter Riederer, ML – *University Hospital Würzburg*

Yossi Segal – Secretary, *The Israel Academy of Sciences and Humanities*



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Sunday, Dec 1, 2013

Chairs: Yadin Dudai – *The Weizmann Institute of Science, Rehovot*
Peter Riederer, ML – *University Hospital Würzburg*

09:00 - 09:30 Greetings and Opening Remarks

Ruth Arnon
President, *The Israel Academy of Sciences and Humanities*

Jörg Hacker
President, *The German National Academy of Sciences, Leopoldina*

Principles of Neuronal Organization

09:30 - 10:00 Wolf Singer, ML
Max Planck Institute for Brain Research, Frankfurt
The Dynamic Brain: The Role of Temporal Coordination in Normal and Disturbed Cognitive Functions

10:00 - 10:30 Elad Schneidman
The Weizmann Institute of Science, Rehovot
A Thesaurus for a Neural Population Code

10:30 - 11:00 Helmut Kettenmann, ML
Center for Molecular Medicine, Berlin
Microglia

11:00 - 11:30 *Coffee Break*

11:30 - 12:00 Haim Sompolinsky
The Hebrew University, Jerusalem
Functional Local Circuits in the Cortex

12:00 - 12:30 Peter Jonas, ML
Institute of Science and Technology, Klosterneuburg, Austria
Nanophysiology of Fast-Spiking, Parvalbumin-Expressing Interneurons



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12:30 - 13:00

Amiram Grinvald
The Weizmann Institute of Science, Rehovot
Imaging Neuronal Organization in Space and Time

13:00 - 14:00

Lunch

Functional Networks

Chairs:

Wolf Singer, ML - *Max Planck Institute for Brain Research, Frankfurt*
Itzhak Fried – *Tel Aviv Sourasky Medical Center and Tel Aviv University*

14:00 - 14:30

Shimon Marom
Technion – Israel Institute of Technology, Haifa
Instability in Neurons and Networks: Impacts on Representation

14:30 - 15:00

Alexander Borst, ML
Max Planck Institute of Neurobiology, Martinsried
Neural Circuits for Fly Visual Course Control

15:00 - 15:30

Nachum Ulanovsky
The Weizmann Institute of Science, Rehovot
Neuronal Representation of 2-D and 3-D Space in The Hippocampal Formation of Bats

15:30 - 16:00

Coffee break

16:00 - 16:30

Angela D. Friederici, ML
Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig
The Neural Network of Language Processing

16:30 - 17:00

Israel Nelken
The Hebrew University, Jerusalem
The Representation of Surprise in the Auditory System

17:00 - 17:30

Gerd Kempermann
German Center for Neurodegenerative Diseases, Dresden
Functional Benefits from Adult Hippocampal Neurogenesis



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17:30 - 18:00 Hamutal Slovin
Bar-Ilan University, Ramat-Gan
**From Local Stimulus Attributes to Perceptual Processing in
the Visual Cortex of Behaving Monkeys**

19:00 *Dinner*

Monday, Dec 2, 2013

Network Plasticity

Chairs: Amiram Grinvald - *The Weizmann Institute of Science, Rehovot*
Gerd Kempermann - *German Center for Neurodegenerative
Diseases, Dresden*

09:00 - 09:30 Hannah Monyer, ML
Neurobiology Clinic, University of Heidelberg
Spatial Coding and Spatial Memory in Rodents

09:30 - 10:00 Itzhak Fried
Tel Aviv Sourasky Medical Center and Tel Aviv University
**Neuronal Representation of Human Memory: Lessons from
Single Neuron Recordings**

10:00 - 10:30 Jason Kerr
Max Planck Institute for Biological Cybernetics, Tübingen
**Imaging Activity in the Freely Moving Animal: from the Eye to
the Cortex**

10:30 - 11:00 *Coffee break*

11:00 - 11:30 Amir Amedi
The Hebrew University, Jerusalem
Plasticity and Stability in Blindness and Visual Rehabilitation



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11:30 - 12:00 Stefan Treue
German Primate Center, Göttingen
**Information Processing in Primate Visual Cortex - an Interplay
between Sensory and Attentional Signals**

12:00 - 12:30 Misha Tsodyks
The Weizmann Institute of Science, Rehovot
**Universal Scaling Laws of Information Retrieval from Long-Term
Memory**

12:30 - 14:00 *Lunch*

Pathological Network Functions

Chairs: Michael Frotscher, ML - *Center for Molecular Neurobiology, Hamburg*
 Moussa Youdim, ML - *Technion – Israel Institute of Technology, Haifa*

14:00 - 14:30 Hagai Bergman
The Hebrew University, Jerusalem
**Computational Physiology of the Basal Ganglia and their
Disorders**

14:30 - 15:00 Michael Frotscher, ML
Center for Molecular Neurobiology, Hamburg
Role for Reelin in Stabilizing Cortical Architecture

15:00 - 15:30 Rony Paz
The Weizmann Institute of Science, Rehovot
**Generalization of Emotional Learning, Cross-Regional
Interactions and Local Network Architecture that Underlies
Normal Choice-Behavior and Anxiety-Disorders**

15:30 - 16:00 Uwe Heinemann
Institute for Neurobiology, Charité, Berlin
**Disturbed Homeostatic and Synaptic Plasticity in the
Pathogenesis of Focal Epilepsies**

16:00 - 16:30 *Coffee break*



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16:30 - 17:00

Daniel Durstewitz

RG Computational Neuroscience, Mannheim

**Dynamic Neuronal Representations During Working Memory
and Decision Making**

17:00 - 17:30

Alon Friedman

Ben-Gurion University of the Negev, Beer-Sheva

**Dysfunction of the Neurovascular Network in Neurological
Disorders: from Homeostatic to Pathological Plasticity**

19:00

Dinner